Academia is the cradle of new research and findings; there is no better place for ideas to take shape in their purest form. And, teaching is the foundation of academia. I teach and aspire to a professional teaching career because I enjoy doing it immensely. As an academician, I perceive teaching as complementary to research, as both foster the liberty of sharing knowledge to bring about changes for the betterment of our society.

Motivation

During the early stage of my student life, I mostly resorted to self-teaching, ascribing to the scarcity of competent math teachers. Such an endeavor, however, prompted me to appreciate the necessity of a good teacher, particularly in the field of mathematics. It sometimes resulted in spending long, enervating episodes to apprehend an elusive concept. However, I found different ways to teach it to a student in the pursuit of teaching myself. Long before I started teaching students, I would often conceive of myself as a teacher teaching concepts the way I wanted them to be taught to me. As I learn, so I teach. My first teaching opportunity turned up when I was a graduate student. Since then, teaching has always been helping me understand the concepts better and express myself more eloquently. Above all, the ecstatic joy I perceive in helping students grow sustains my relentless enthusiasm for teaching.

Training and Experience

My early teaching career in India mostly included preparing students for competitive exams. I eventually found myself so involved in teaching that I decided to co-found a tutoring institute in Bangalore, India. Along with my six employees, I mostly aimed to teach various tricks and techniques for undergraduate calculus, analysis, and linear algebra. The company made a profit, but what it yielded more in me was the desire to pursue a Ph.D. to enhance my knowledge of mathematics and exposure to teaching.

At Tulane. The Ph.D. program at Tulane University opened up a whole new spectrum of training opportunities in research and teaching. I have learned that a successful teacher knows how to look through a student's eyes. As a ***teaching assistant*** for ***four years***, I engaged with my students in the recitation labs for courses, like statistics, calculus, and applied mathematics. It helped me better gauge their perspective, along with their problems and needs. Being an international student, it was a crucial experience working in such a different at the same time diverse academic and cultural environment. It was all put into action when I contrived an opportunity to teach ***undergraduate statistics*** as a student instructor at Tulane.

At UCB. My exposure to teaching debouched into a broader realm when I joined UC Berkeley as a ***postdoctoral fellow***. Alongside conducting research in data science, the responsibilities entail teaching graduate ***statistics for data science*** for the MIDS program between Fall 2020–Summer 2023. According to Fortune[1], MIDS is the No.2-ranked Master of Information and Data Science program in the US. For the program, I also developed course curricula, prepared materials and tests, and devised technology to facilitate teaching and learning. After the first two semesters, my overall rating always hovered above the department's average—a testimony to the fact that my style of instruction had been well-received by the students.

At GWU. In Fall 2023, I started teaching graduate ***introduction to data mining*** and ***computer science*** for the data science program[2]. Alongside putting enough emphasis on the theory of data science, I make my students industry-ready through programming challenges and interdisciplinary projects.

At NIT, India. While topological data analysis is growing apace in the US, it still remains an unheard-of field in India. In the fall of 2022, I gave an informal overview of persistent homology and its applications to a group of graduate students at the National Institute of Technology (NIT), India. The students were intrigued by the beauty and prospect of the subject. At the request of the physics department there, I offered a graduate topic course on TDA in Fall 2023.

[1] https://fortune.com/education/information-technology/masters/rankings/best-online-masters-in-data-science
[2] https://datasci.columbian.gwu.edu/

Future Teaching

My teaching spans a broad spectrum of fields, including mathematics, foundations of data science, statistics, machine learning, and computer science. My teaching interests include—but are not limited to—courses like ***statistics***, ***probability theory***, ***topology***, ***analysis***, ***differential geometry***, ***manifold theory***, ***data mining***, ***algorithms and data structures***, ***computer programming***, ***data science***, ***topological data analysis***, ***applied topology***, ***computational geometry***, ***computational complexity***.

Philosophy

My teaching philosophy is based on student-instructor interaction inside and outside the classroom. It is simply impossible to conjure up a unified method of teaching to account for all students' needs. However, persistent ***interaction with my students*** has proven to mitigate the difficulties that ensued from the differences in their educational and cultural backgrounds. I implement a blend of ***lecture-style*** and ***active learning*** techniques in my class; the proportion is usually decided by the type of the course and the background of the students. The key to learning is to ***get involved***, and in mathematics, ***matured thinking*** and ***matured practice*** have always been rewarded. I tend to leave enough room for both in my well-thought-out homework assignments and recitation sessions. I always encourage ***active participation*** of my students during the lectures. In a gesture of helping each other, ***group efforts*** have also been an effective way to learn the concepts better and improve relations with peers. These in-class and take-home team activities are constantly supervised to ensure a ***psychologically safe*** team environment. After all, it is my responsibility as the instructor to offer an ***inclusive*** learning environment that is welcoming to all walks of life—where no one feels disparaged or experiences ***imposter syndrome***.

Methods and Objectives

With the advent of modern technologies, computers and computer programs have made their passage into academia. Computer software, like Mathematica, Matlab, etc., can help students visualize theorems and build intuitions for them. Not only does the ***touch of computation*** delineate the concepts better, but it also provokes the ***computational thinking*** in students.

As a coding hobbyist, I develop libraries to supplement my teaching and research. As an example, students who are new to statistics occasionally find the concept of different modes of stochastic convergence to be difficult to understand. I promote the use of ***computer-aided visualizations*** to help students make an educated guess about the qualitative and quantitative nature of the limit. I make some of the tools available to students (and to the world) through my interactive tutorials[3]. To organize my courses, I use various ***learning management systems***, like Google Classroom, Canvas, Blackboard, and Gradescope.

The practice of ***flipped classrooms*** took off with its full potential only after the technology became widely accessible to everyone. My instruction at UCB had been heavily dependent on pre-recorded videos and well-crafted reading materials. I have become a proponent of flipped classrooms due to their effectiveness in getting students engaged, active, and talking. I will take the initiative, if needed, to implement the paradigm for my future courses.

The success of flipped classrooms can only be ensured when used in conjunction with frequent, formative feedback. In-class quizzes, Zoom polls, and office hours with a planned agenda have been serving me well in acquiring continual feedback on students' progress, understanding, and engagement.

My courses are structured to attain a broad range of objectives. For theory-heavy courses, like statistics, topology, etc., I tend to stress on ***logical reasoning***, ***proofwriting***, etc. Whereas, applied and professional courses like data science are geared towards problem-solving, analyzing real-world data, etc. Exposing students to ***inter-disciplinary projects*** and ***industry interships***, I help them to make up their minds not only about their major but also about their prospective professional career.

Assessment and Evaluation

I pay special attention to evaluating students against the learning objectives of my courses. In conjunction with summative assessments to evaluate student learning, I address students' unique misconceptions and knowledge gaps through formative feedback.

[3] www.smajhi.com/tutorials

Self-evaluation has become an integral part of my teaching activity. I lay out various strategies for assessing myself. Along with the final evaluation, I collect students' anonymous feedback on my teaching performance on a monthly basis. For honest reviews, I often invite my colleagues to sit in on my class as an observer. From constructive course evaluations to demeaning criticisms posted online, I take into account every source to locate and obviate the challenges.